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Manned Spacecraft Center



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Modification of Physical Properties of Freeze-Dried Rice

A freeze-thaw cycling process has been developed which results in rapid rehydration of freeze-dried rice. Precooked rice is subject to several freeze-thaw cycles prior to freeze-drying.

Normally precooked or parboiled rice which has been dehydrated requires from 5 to 30 minutes of simmering or cooking to produce fluffy, tender rice. Rice dehydrated by this freeze-thaw cycling process reabsorbs water readily and is regenerated into a soft, tender product similar in texture to fully cooked rice in approximately 1 minute.

The freeze cycling process consists of alternately freezing and thawing precooked rice for two complete cycles. The rice is then frozen and freeze-dehydrated in a vacuum sufficient (250 microns Hg) to remove water from the rice by sublimation. The rice can be completely rehydrated in hot water (100-200° C).

It appears that the freeze-cycling process produces modification in the rice's grain structure and thereby its porosity. This enables the grains to reabsorb water more readily.

In the last few years there has been increased industrial interest and significant technical advance in the field of dried food products. Examples are powdered milk, freeze-dried instant coffee, dried soups, cereals,

and dried pet foods. For this reason, food processors in general may have interest in this process.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
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Reference: TSP71- 10259

Patent status:

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